Measures for a
College and Career Indicator:

Career Preparedness Assessments
Multiple Measures

Presented to the
California PSAA Advisory Committee
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Project Context

Senate Bill 1458 changes accountability requirements from a near-total reliance on state test scores in English and mathematics to a broader range of measures, one of which is a college and career preparedness indicator.

The Department of Education contracted with EPIC to provide analyses of a wide range of potential indicators.

Project Overview

- EPIC developed and presented a series of white papers and will develop a final summary report.
- Each paper analyzes a set of measures selected by the PSAA Advisory Committee.
- Final report summarizes findings across measures and offers insights.

Date	Paper/Report
April 2014	1. SAT/ACT 2. Advanced Placement/International Baccalaureate
June 2014	3. Innovative Measures 4. Course-Taking Behaviors
August 2014	5. Career Preparedness Assessments 6. Multiple Measures
January 2015	Final report to State Board of Education

Analytical Framework

Framework consists of 10 evaluative criteria organized into clusters.

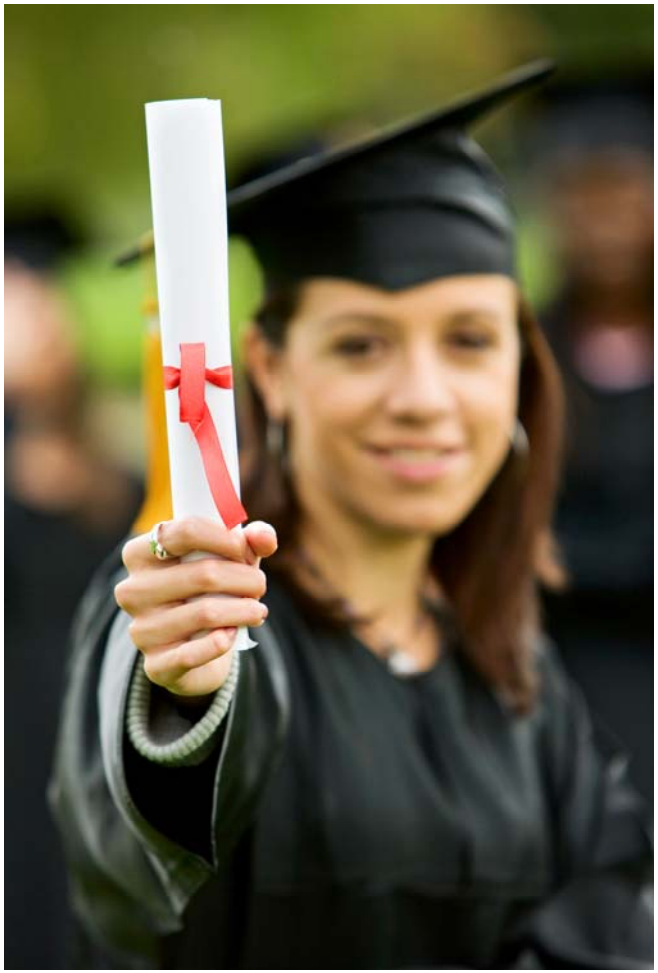
Each criterion rated on a 3-point scale: strong, moderate, weak.

A. Technical Quality
   1. Demonstrates research-based relationship to postsecondary success
   2. Allows for fair comparisons
   3. Is stable

B. Stakeholder Relevance
   1. Has value for students
   2. Is understandable to stakeholder groups
   3. Measures content, skills, and competencies that can be taught and learned in school
   4. Emphasizes student performance

C. System Utility
   1. Minimizes burden
   2. Covers wide number of students
   3. Recognizes a variety of postsecondary pathways

CAREER PREPAREDNESS ASSESSMENTS



Career Preparedness

- Economic shift: manufacturing and agriculture to service and knowledge-based occupations.
- U.S. education has not kept pace with economic change.
- Remnants of traditional vocational education linger in many schools.
- New CTE and pathways models emerging in schools.

Career Preparedness

- Many skills central to college and career success overlap.

Example Skills/Strategies/Knowledge		
Metacognitive	Cognitive	Content
Ownership of learning	Problem formulation	English foundational knowledge
Persistence	Information collection	Math foundational knowledge
Time management	Interpretation and analysis	Writing foundational skills

- Specific skills needed for preparedness depend upon the career pathway an individual chooses.

EPIC's Definition of Career Preparedness

- Work preparedness skills
  - Self-management and self-discipline
    - Getting to work on time, not being on drugs, not having conflict with supervisors
- Job preparedness skills
  - Communication and collaboration skills
    - Speaking and listening
    - Understanding needs of customers/coworkers
- Career preparedness knowledge and skills
  - All the work and job preparedness skills *plus:*
    - Academic and technical skills necessary to acquire an entry-level certificate
    - Learning-to-learn skills necessary to continue acquiring new knowledge and skills to progress on a career pathway

ACT's WorkKeys

- WorkKeys is a job preparedness assessment system designed to meet employers' needs and signal students.
- WorkKeys consists of 11 assessments.
  - 8 measure foundational skills
  - 3 measure soft skills
- The National Career Readiness Certificate (NCRC) can be earned by passing 3 foundational skill assessments: Applied Mathematics, Locating Information, Reading for Information.
  - Bronze, Silver, Gold, and Platinum levels based on scores
    - For example, platinum level indicates student should succeed at 99% of the 19,000 jobs in the WorkKeys database

National Occupational Competency Testing Institute (NOCTI)

- NOCTI offers
  - Pathway assessments across 11 industry sectors
  - Job-ready assessments across 16 industry sectors
  - Employability skill assessments
- Pathway assessments consist of pre- and post-test combination, or a post-test only, all multiple choice.
- Job-ready assessments consist of pre-test, post-test, or both.
  - Option to take multiple-choice test or version that combines multiple-choice and performance task items
- States can customize assessments to fit unique CTE needs.

Armed Services Vocational Aptitude Battery (ASVAB)

- Administered by the United States Military Entrance Processing Command and used by each branch of the armed forces.
- Measures overall suitability of recruits and their likely success in specific programs within the armed forces.
- Uses multiple-choice format with 10 subtests covering four domains:
  - Verbal, math, science & technical, and spatial
- Department of Defense does not endorse ASVAB for purposes other than measuring military qualifications.

Industry Certifications

- Thousands of industry-specific certification assessments exist nationwide.
  - Medicine, K–12 education, automotive services, and many others
- Candidates can receive credentials that are widely accepted as indicators of preparedness and that meet legal and technical requirements of a position.
- These assessments do not measure foundational skills needed to be successful in a range of careers.

State Uses of Career Assessments in Accountability

- States use career preparedness assessments for a variety of purposes including:
  - to comply with the reporting requirements under Perkins IV
  - to replace high school exit exams
  - to award a career endorsement on a diploma
  - to award performance scholarships
  - as part of data profiles for teacher evaluation
- Few states use WorkKeys, ASVAB, or industry certifications for accountability purposes.

State Uses of Career Assessments in Accountability

- Illinois and North Carolina: WorkKeys
- Missouri: ASVAB
- Alabama, Florida, Georgia, Indiana, New Jersey, and Ohio: Industry certification
- Kentucky: WorkKeys, ASVAB, and industry certifications
  - Qualifies students as college prepared, career prepared, or college *and* career prepared.

College Ready	**Career Ready** Academic	Technical	**Bonus: College and Career** College	Career
Must meet the benchmark on one of the following:	Must meet the benchmark for one of the following:	Must meet the benchmark or earn one of the following:	Must meet the benchmark or earn one of the following:	Must meet the benchmark or earn one of the following:
ACT	ASVAB	KOSSA	ACT	KOSSA
ACT's Compass	ACT's WorkKeys	Industry Certificate	ACT's Compass	Industry Certificate
KYOTE			KYOTE	

Career Preparedness Assessments Technical Quality

A1. Relationship to Postsecondary Success

- Lacks sufficient peer-reviewed, independent validity research.
- Used widely for gathering career preparedness information.
- Little information on how well these assessments gauge a school's contribution to preparing students for careers.

A2. Fair Comparisons

- Lacks sufficient peer-reviewed, independent fairness research.
- Needs large-scale studies evaluating statewide samples.
- ACT, NOCTI, and ASVAB conduct analyses to detect item bias.

Career Preparedness Assessments Technical Quality

A3. Stability

- WorkKeys and ASVAB are more stable because of more resources devoted to development, research, and improvement.
- NOCTI uses an internal consistency model to evaluate the reliability of test items.
- NOCTI and industry certifications present the challenge of equating scores and ensuring the quality of the various assessments.

Career Preparedness Assessments Stakeholder Relevance

B1. Value to Students

- Direct
  - Planning to enter the military (ASVAB)
  - Earning an industry certificate (NOCTI)
  - Seeking college credit (NOCTI)
- Indirect
  - Career exploration (WorkKeys and ASVAB)
  - Metacognitive skill development (some WorkKeys and NOCTI assessments)

Career Preparedness Assessments Stakeholder Relevance

B2. Public Understanding

- All assessments presented here are largely unfamiliar to those outside a small circle of educators and employers.
- WorkKeys and NOCTI provide considerable information on their websites, which can improve understanding.

B3. Content, Skills, or Competencies

- NOCTI and industry certifications are potentially more instructionally sensitive than WorkKeys and ASVAB.

B4. Emphasis on Student Performance

- Each assessment measures student performance and not educational inputs or processes.

Career Preparedness Assessments System Utility

C1. Minimal Burden

- WorkKeys and ASVAB will likely produce the smallest system-level burden, followed by NOCTI, and finally industry certifications.
  - Equating results across different assessments will be challenging

C2. Student Coverage

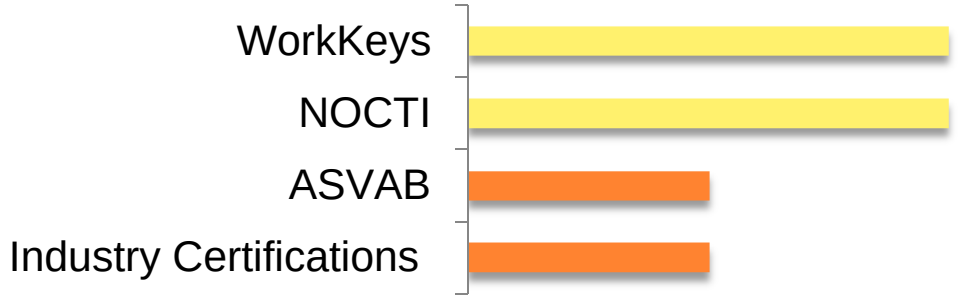
- Potential for strong coverage, but not currently.
- Industry certification assessments offer the most immediate opportunities for expanded coverage.

C3. Postsecondary Pathways

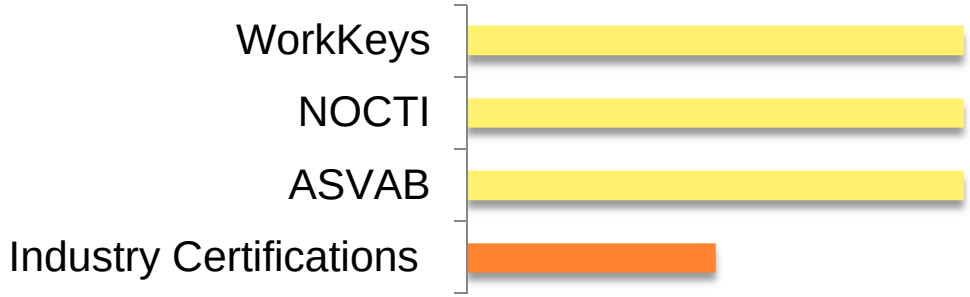
- Geared almost exclusively toward the career-going pathway.

Summary – Technical Quality

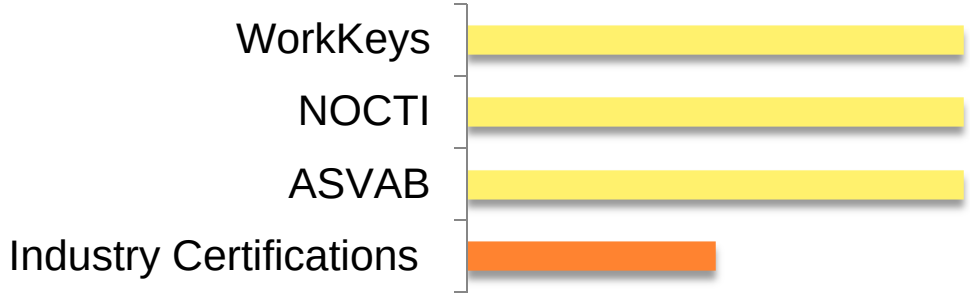
A1. Relationship with postsecondary success



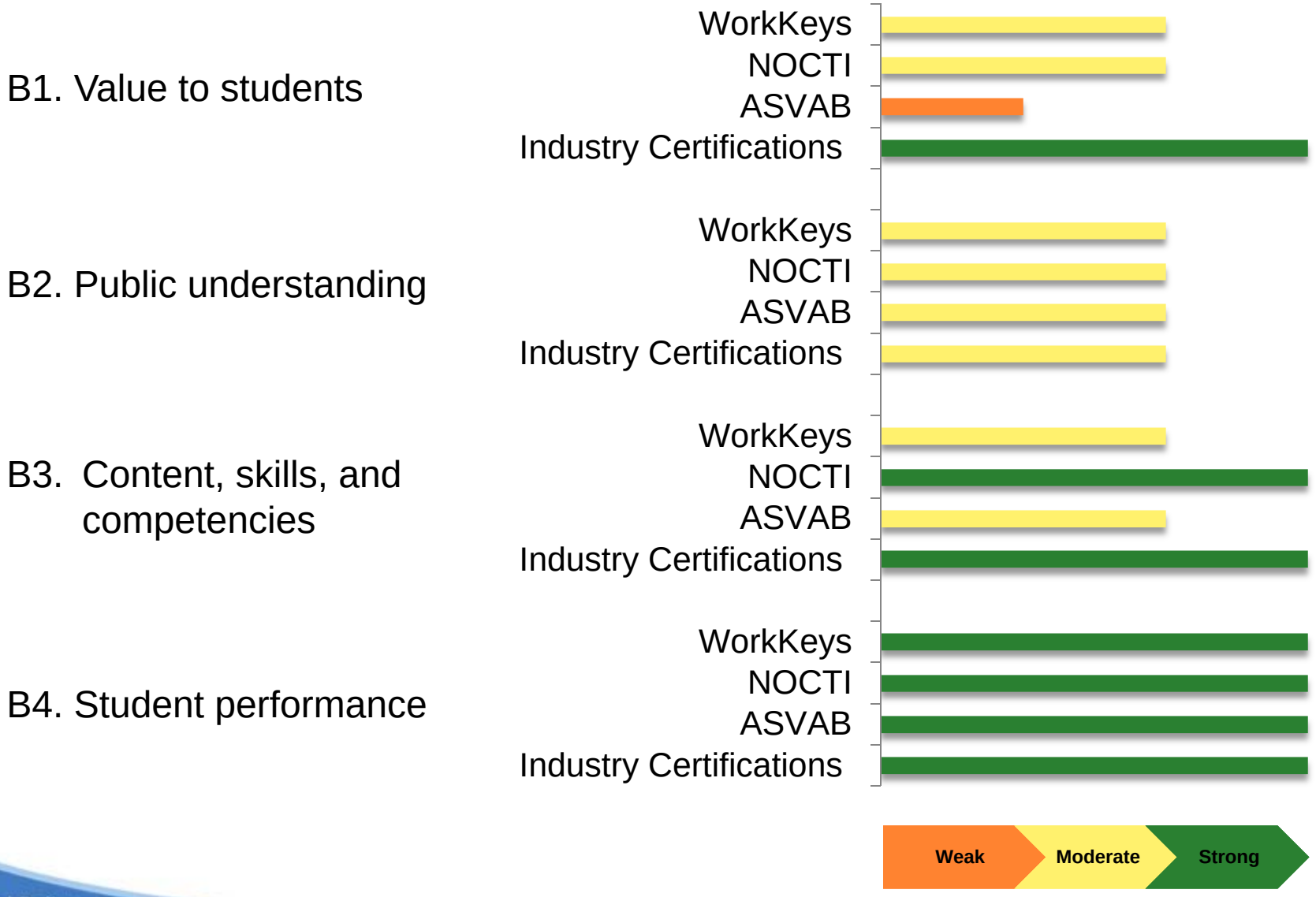
A2. Fairness



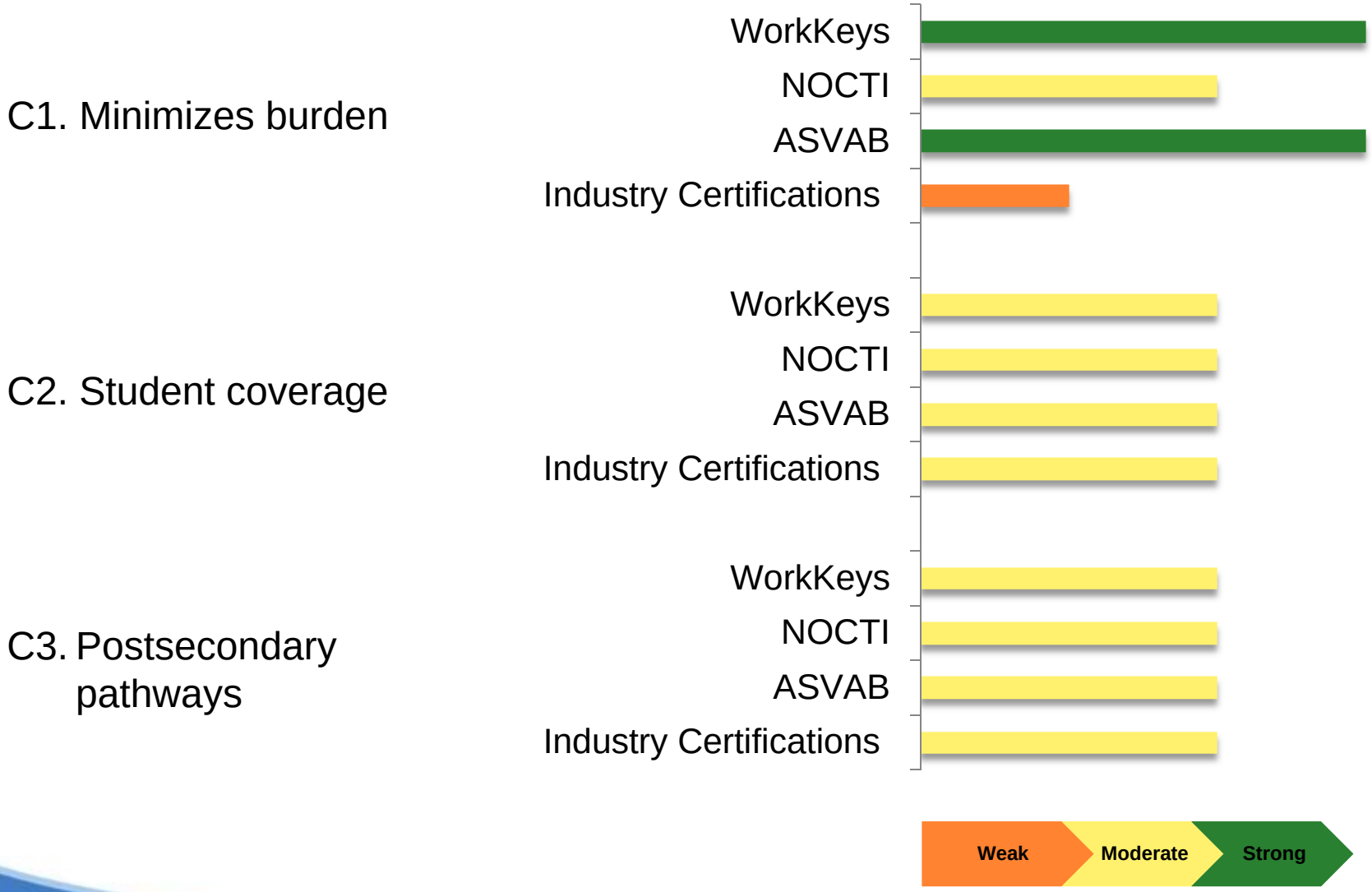
A3. Stability



Summary – Stakeholder Relevance



Summary – System Utility



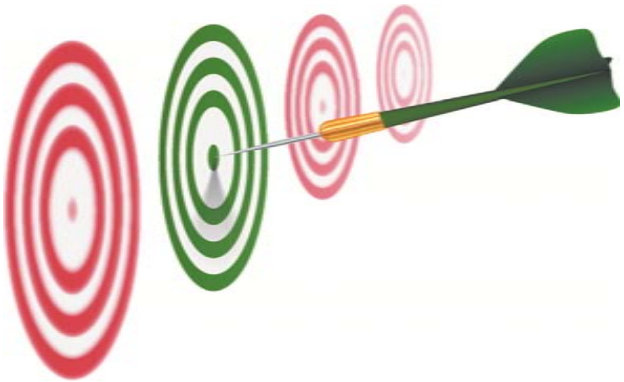
Career Preparedness Assessments Summary

- They have not been designed with K–12 accountability systems in mind.
- They lack independent, peer-reviewed research, which limits claims of validity, fairness, and stability.
- They present challenges but also offer opportunities:
  - Good measures of the economy
  - Insight into key dimensions of preparedness
- Deeper understanding of these assessments will evolve as more researchers grapple with career preparedness.

Questions or Comments?

MULTIPLE MEASURES

- Increase accuracy, consistency, reliability, and capacity to identify unintended consequences.
- Encourage effective teaching of critical content.
- Attenuate each measure's individual limitations.



Single Measures in Accountability

- 1900–1980: Accreditation of schools based on inputs.
- 1990s: Rise of academic standards, A–F report cards.
  - At this point, California's standards lead the nation
- 2000s: No Child Left Behind testing and Adequate Yearly Progress gap-gazing.
- 2010s: Race to the Top and No Child Left Behind waivers prompt systems revisions, including Multiple Measures.

What Do Multiple Measures Entail?

Definitions in Research

- Multiple constructs
- Multiple measures of a single construct
- Multiple attempts at the same measure of a single construct

Critical Design Criteria

- Stakeholder collaboration
- Design method
- Breadth of coverage
- Measurement/reporting type
- Combination method
- Ability to compare
- Stakes

Design Criteria

Design Criterion	Levels (*most to least complex*)	Trade-offs and Considerations
Stakeholder Collaboration	• Consensus • Hybrid • Top-down	• Cohesion • Flexibility • Local autonomy • Resources • Fairness • Implementation fidelity
Design Method	• Independent • Piggyback • Cyclical • Patchwork • Status quo	• Early detection • Stability • Blind spots • Collaboration • Technical expertise
Breadth of Coverage	• Comprehensive • Unified • Overlapping • Isolated	• Targeting critical areas • Accountability paradox • Reporting complexity • Strategic planning • Cost

Design Criteria

Design Criterion	Levels (*most to least complex*)	Trade-offs and Considerations
Measurement/Reporting type	• Quasi-longitudinal • Successive groups • Status • Mandatory reporting • Optional reporting	• Reliability • Ability to compare • Future orientation • Patience/political will • Complex analyses • Strength of causal inferences
Combination Method	• Matrix • Compensatory • Conjunctive • Complementary	• Nuance • Sensitivity to detect student weaknesses • Weighting • Student abilities gauged by depth and breadth • Public understanding

Indicators Measured and Reported

- ACT/SAT participation/results
- AP participation/results
- Dual enrollment participation/completion
- IB participation
- % enrolled in post-secondary programs
- Industry certifications
- % taking higher-level courses
- CTE certifications/competencies
- College-going rate
- % needing college remediation
- ACT WorkKeys
- % taking Algebra in Grade 8

Example of Matrix Method

High ACT, High CR, High WK	High ACT, High CR, Mid WK	High ACT, Mid CR, High WK
Mid ACT, High CR, High WK	High ACT, Mid CR, Mid WK	Mid ACT, Mid CR, High WK
Mid ACT, High CR, Mid WK	High ACT, High CR, Low WK	High ACT, Low CR, High WK
Low ACT, High CR, High WK	Mid ACT, Mid CR, Mid WK	High ACT, Mid CR, Low WK
High ACT, Low CR, Mid WK	Mid ACT, High CR, Low WK	Mid ACT, Low CR, High WK
Low ACT, High CR, Mid WK	Low ACT, Mid CR, High WK	Mid ACT, Mid CR, Low WK
Mid ACT, Low CR, Mid WK	Low ACT, Mid CR, Mid WK	High ACT, Low CR, Low WK
Low ACT, High CR, Low WK	Low ACT, Low CR, High WK	Mid ACT, Low CR, Low WK
Low ACT, Mid CR, Low WK	Low ACT, Low CR, Mid WK	Low ACT, Low CR, Low WK

ACT = ACT results
CR = % of students in need of college remediation
WK = WorkKeys results

White = Higher performance
Yellow = Mid-range performance
Red = Lower performance

Other Criteria

Ability to Compare

- Against normative standards
- Across nations
- Across populations domestically
- Within subjects over time

Stakes Should Reflect

- Confidence in measures
- Desire to influence practice

Georgia

Compensatory, complementary, and conjunctive

College preparedness accounts for 18% of school score

Indicator	Description
1. Course-taking behavior	Percentage of graduates completing one of the following: • Career Technical/Agricultural Education (CTAE) pathway • advanced academic pathway • fine arts pathway • world language pathway
2. Career preparedness	Percentage of CTAE pathway completers earning one of the following: • national industry-recognized credential • IB Career-Related Certificate • passing score on a state-recognized, end-of-pathway assessment (beginning in 2014-2015)
3. College-course preparedness	Percentage of graduates: • entering two- or four-year in-state colleges not requiring remediation or learning-support courses • scoring program-ready on ACT's COMPASS • scoring at least 22 out of 36 on the composite ACT • scoring at least 1550 out of 2400 on the combined SAT • scoring 3 or higher on two or more AP exams, or • scoring 4 or higher on two or more IB exams
4. Dual or concurrent enrollment	Percentage of graduates earning high school credit(s) for • accelerated enrollment via ACCEL • Dual HOPE Grant • Move On When Ready • Early College • Gateway to College • Advanced Placement courses, or • International Baccalaureate courses
5. Postsecondary writing preparedness	Percentage of students scoring at *Meets* or *Exceeds* on the Georgia High School Writing Test
6. Postsecondary reading preparedness	Percentage of students achieving a Lexile measure greater than or equal to 1275 on the American Literature End-of-Course-Test (EOCT)
7. Postsecondary overall academic preparedness	Percentage of EOCT assessments scoring at the *Exceeds* level
8. Attendance	Student Attendance Rate (%)

Florida

Compensatory and complementary

College preparedness accounts for 12.5% of school score

A–F Grades Based on a 1600-point Scale

- State standardized test scores account for 50%
- Graduation rate accounts for 18.75%
- Acceleration accounts for 18.75%
  - Participation and performance on AP, IB, or other courses where students can earn college credit
- College readiness accounts for 12.5%
  - Performance on ACT, SAT, Florida College Entry-Level Placement Test, or the Postsecondary Education Readiness Test

Texas

Matrix and complementary

College preparedness accounts for 25% of school score

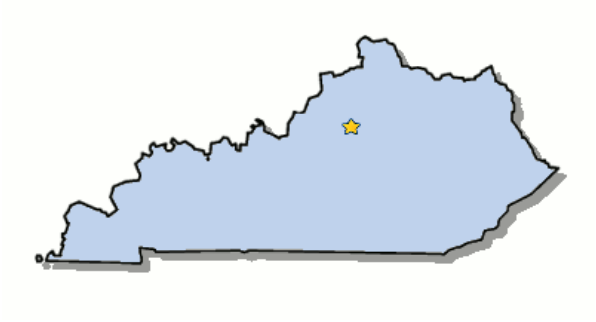
Four Equally Weighted Indicators

- Student percentage postsecondary-ready on STAAR assessments
- Graduation rates
- Student percentage graduated with Recommended HS or Distinguished Achievement Programs (course-taking behavior), and
- Graduate percentage meeting criteria on the reading/English language arts and mathematics Texas Assessment of Knowledge exit-level test, SAT, or ACT

Distinctions

- Earned for participation and advanced performance on STAAR assessments, SAT/ACT, or AP/IB exams

Kentucky



College Ready
Must meet the benchmark on one of the following:
ACT
ACT's Compass
KYOTE

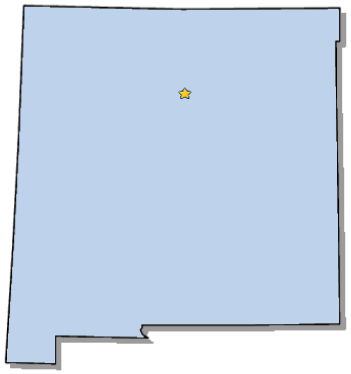
Career Ready	
Academic	Technical
Must meet the benchmark for one of the following:	Must meet the benchmark or earn one of the following:
ASVAB	KOSSA
ACT's WorkKeys	Industry Certificate

Compensatory and conjunctive

College preparedness accounts for 14% of school score

Bonus: College and Career	
College	Career
Must meet the benchmark or earn one of the following:	Must meet the benchmark or earn one of the following:
ACT	KOSSA
ACT's Compass	Industry Certificate
KYOTE	

New Mexico



Complementary

College preparedness accounts for 15% of school score

Multiple Attempts, Multiple Indicators, and Multiple Years

- PSAT or National Merit Scholarship Qualifying Test
- SAT
- College Board's ACCUPLACER assessment
- ACT's PLAN assessment
- ACT
- ACT's Compass assessment
- 1 AP exam
- 1 IB exam
- Concurrent or dual enrollment
- CTE course pathway completion

Oklahoma

Compensatory and complementary

College preparedness can add as much as 5% toward school score

Bonus Points for Meeting State Thresholds

- Participation/performance in advanced coursework (e.g., AP, IB, dual enrollment, Advanced International Certificate of Education, or CTE courses for industry certificates)
- Participation/performance on SAT or ACT
- On-time graduation of low-achieving, 8th graders
- Improving annual growth on three bonus-point categories

Missouri

Compensatory, complementary, and conjunctive

College preparedness accounts for 21% of school score

Multilevel Calculation Including:

- Percentage at/above standard for participation and performance on the ACT test, SAT, ACT's Compass, or ASVAB
- Percentage with qualifying score on AP, IB, or Technical-Skills Attainment assessment
- Percentage attending postsecondary education/training

SAT Math and Reading Score Combined	Multiplier for No. of Students at Level
Graduates scoring 1190–1600	x 1.25
Graduates scoring 990–1180	x 1.00
Graduates scoring 870–980	x 0.75
Graduates scoring < 870	x 0.25
Graduates not participating	x 0

Challenges with Multiple Measures

- Will current resources support design, development, administration, and scoring?
- How will the new system affect instructional time?
- Can state expertise handle technical aspects of combination?
- What validity concerns should a state anticipate?
- What trade-offs exist between immediate and incremental implementation?
- What trade-offs exist between simple and complex systems?

Whole-System Effects

- A multiple-measure system without carefully chosen indicators could disproportionately emphasize college or career.
- Selecting measures requires the state to understand effects of prioritizing participation along with or over completion of some indicators.
- A multiple-measures system allows identification of Opportunity to Learn.
- Current multiple-measure accountability systems ignore crucial indicators such as:
  - expository writing
  - speaking and listening
  - academic mindset
  - goal orientation and aspirations
  - learning techniques
  - metacognitive skills
  - proficiency in languages other than English
  - creativeness and expressiveness

New Conceptions

- Conley and Darling-Hammond (2013) endorse uses of multiple measures that allow systems to examine quality of classrooms, schools, schools systems, and states comprehensively.
  - Creating such a system requires supplementing standardized tests with additional data that helps systems develop rich profiles to evaluate and convey insights.
  - Information can be aggregated upward to reach accountability decisions about schools and systems.

Questions or Comments?

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